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ABSTRACT

The effects of early education bilingual programs on subsequent educational achievement were studied with Spanish-speaking children of migrant farm workers in southern Texas. The children were enrolled in the Individualized Bilingual Instruction (IBI) program for at least one year from preschool through grade 3. About 30-50 children were tested at each grade level, and a like number were tested in a neighboring school for a comparison group. IBI children and the comparison group of Spanish-speaking, migrant farm worker children did not differ significantly on pretests. For the followup study, about 10 IBI children and about 15 comparison group children were tested at each grade level, grades 4-6. At this time, IBI children had been out of the IBI program from 1-5 years. IBI children had special instruction one hour a day. During the winter months, they were taught in the home base area, while special instruction was continued in temporary locations in the north during the migrant work season. The instructional materials were structured and sequenced, and the lessons were individualized. Frequent mastery checks were also provided. For the followup study, the Peabody Picture Vocabulary Test and the math and reading subtests of the Wide Range Achievement Test were administered to students. FIndings include: (1) IBI children learned English much faster than children in the comparison group; (2) IBI children maintained and improved their Spanish; (3) IBI children achieved much higher scores in reading and arithmetic than comparison children; and (4) the IBI children's superiority was maintained at upper grade levels after they left the program. (SW)

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BILINGUAL EDUCATION: WILL THE BENEFITS LAST?*

Beverly B. McConnell

ABSTRACT

The long-term benefits of an early childhood program of bilingual individualized instruction for Spanish-speaking children is measured after children have been out of the program from one to five years. The study compares the progress of the follow-up sample to a comparison group of children of like background in the same grade levels at a neighboring school. The tests used measure vocabulary development in children's first and second languages as well as their academic skills in arithmetic and English reading. The findings are discussed in terms of the cost effectiveness of bilingual schooling.

Will the benefits last? This is a question that hangs over every special program in education. Children can make impressive gains in academic achievement while they receive special treatment. When the extra support is withdrawn, will the children still be better off?

A recent study (McConnell, 1981) found that a program of bilingual education called "Individualized Bilingual Instruction" (IBI) produced marked superiority in participating students up to

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*This article is based on a paper presented at the thirteenth annual conference of the International Congress for Individualized Instruction, Tucson, Arizona, October 28, 1981. For a more complete report on this study, including statistical details of test scores, see Beverly B. McConnell, **Long Term Effects of Bilingual Education** (Pullman, Washington: Bilingual Mini Schools, 1981). (Available from the IBI Project Evaluation Office, S. W. 615 Cityview, Pullman, WA 99163 for $8.00.)

the third grade level when compared to similar children in a neighboring school. The study also tested children enrolled in the regular school program at grades four through six who had attended IBI at earlier grade levels. These children had consistently higher scores than the comparison group in reading and math as well as higher vocabulary scores in English and Spanish. The benefits of participation in an early education bilingual program, therefore, appear to last long after the period of their attendance in the program.

THE STUDY SAMPLE

Children in the IBI sample were enrolled in the "mobile component" of the IBI program. (The "mobile component" is explained in the next section.) The children were from a small town in south Texas. Their families were migrant farm workers. Spanish was their first language and the primary language used in their homes. Children attended the IBI program from preschool through third grade. Test results were reported only for children who had attended the program for at least one school year (over 200 days total attendance). Approximately 30 to 50 children were tested at each grade level, kindergarten through third grade, and a like number were tested in a neighboring school for a comparison group.

For the follow-up study, about ten children who had been enrolled in the IBI program were tested at each grade level, fourth through sixth grade. At the time of the follow-up study, individual children had been out of the IBI program anywhere from one to

five years. For the comparison group, approximately 15 children per grade level were tested in grades four through six.

Children in the comparison group at the neighboring school met the same criteria used to determine eligibility for the IBI program. Their first language was Spanish, and it was the primary language of the home. Their parents' primary source of income was migrant farm work, and the families left the area for a period of time each year to do seasonal work.

To assure the initial comparability of the two groups of children, apart from the influence of their participation in the IBI program, two types of statistical comparisons were made. Pre-test scores of children before they had participated in the IBI program were compared to scores of children at the neighboring school of the same age. This showed that at almost all age levels on all tests there were no significant differences between the two groups. In all cases where there did appear to be a statistically significant difference, the comparison group had the higher score. In other words, the effect of very minor initial differences between the groups favored the comparison group, not children in the IBI program (McConnell, 1980).

The IBI program is a supplemental program at the school-age level (a "pull-out" program which children attend approximately one hour a day). Children attend regular classes the rest of the day. Not all children attend the IBI program in the school where it is offered. Some other migrant children from the same school, but not enrolled in the IBI program, were tested. Their scores were also compared to children of the same ages in the neighboring

school, and again there appeared to be no significant differences. It would appear, therefore, that the effects of the regular school programs in the two schools are approximately the same, except for those children enrolled in the IBI program.

DESCRIPTION OF THE EXPERIMENTAL PROGRAM

The "mobile component" of the IBI program is part of a larger demonstration project for Spanish-speaking migrant children. It was designed to provide greater continuity in the education of children who move in the migrant stream. Children are taught in the home base area where they live during the winter months. When the children move north during the work season, the program is continued in several temporary locations in the north so that the majority of the children are able to enroll at more than one place during the year. They continue in the same curriculum, taught by teachers who have relocated from Texas.

Earlier attempts at this mobile approach to migrant education were not successful. Certified teachers willing to follow the migrant stream could not be recruited or, if they were, they did not last long under such arduous circumstances. The IBI program's solution to this problem was both simple and unprecedented. When there are no teachers who are willing to travel, it becomes necessary to use the people who travel--the migrants themselves--as teachers. The IBI program therefore recruited adults from migrant families and trained them to become teachers. A few had graduated from high school. None were college graduates. Of course, none were certified teachers. All, however, were bilingual, speaking

English with varying degrees of fluency and the Spanish dialect familiar to the children.

In order for this approach to work, the instructional materials had to be structured and sequenced, as inexperienced teachers might not have been able to develop their own lessons or sequence them from the simple to the more complex. Because migrant children's many moves create an erratic attendance pattern, it was also important that the lessons be individualized so that the children could move through them at their own pace and pick up where they had left off after an absence. Taking into account the probability that something will be forgotten with any absence, the curriculum also needed to provide frequent mastery checks so that a child could review material if necessary until ready to move on to more difficult lessons.

In line with these requirements, the IBI project developed, or adapted from commercial sources, a sequential curriculum track for teaching oral Spanish, oral English, math, and reading in both languages. It included placement tests to determine where children should start if they entered at a more advanced level than preschool. Workbooks and programmed materials were used as much as possible so that children could work at their own pace. Based on these curriculum features, the program was given the name, "Individualized Bilingual Instruction" (IBI).

In the IBI program, paraprofessional teachers work in teams in which about ten such migrant adults are trained and supervised by one professional teacher. At the preschool level, each teacher works with up to ten children. In the school-age program, the

teachers may have a series of small groups of children during the day based on the released time schedule that is convenient for the host school. Teachers with more than one group in a day are able to work with 20 to 25 children.

COMPARISONS IN VOCABULARY AND ACADEMIC ACHIEVEMENT

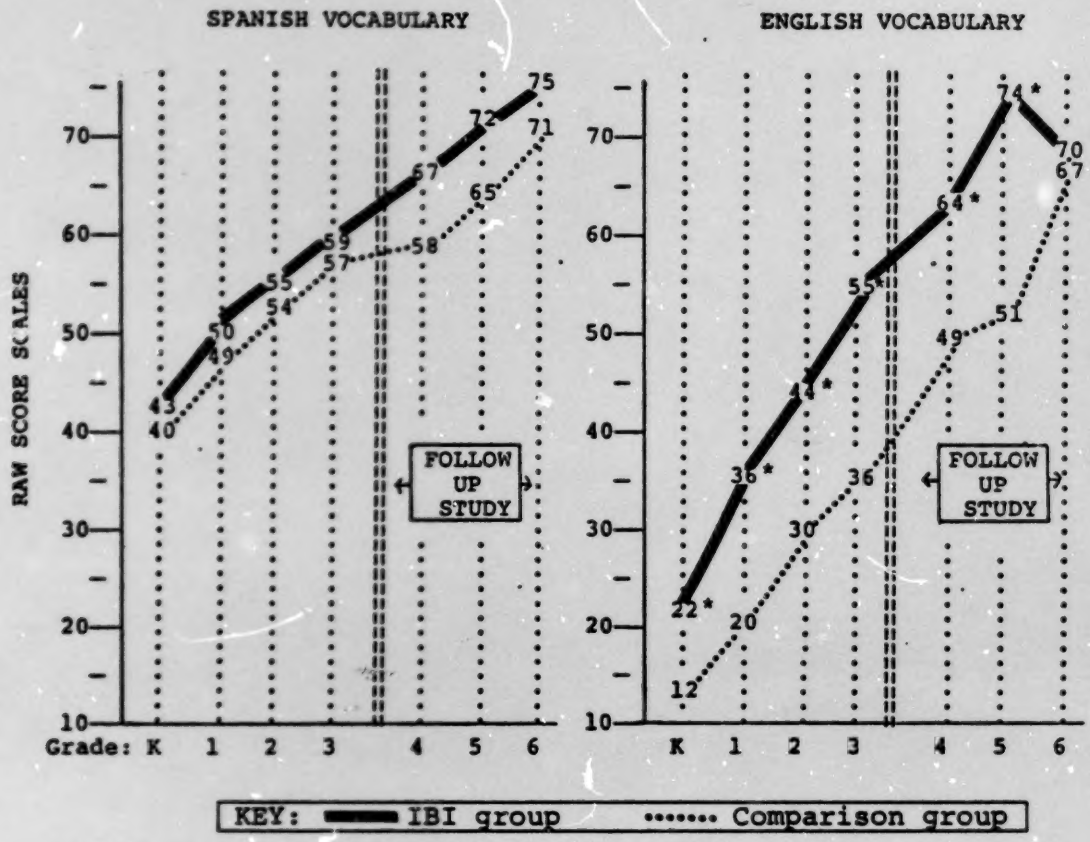
Children were given the **Peabody Picture Vocabulary Test** (Dunn, 1959) as a comparative measure of vocabulary in Spanish and English. Form A was given in English. Form B was adapted, rather than strictly translated, to maintain approximately the same level of difficulty in Spanish. Comparisons of the average vocabulary scores of children in the IBI and in the comparison group are shown in Figure 1. In this figure, the scores of the IBI group through grade three represent children while they were attending the IBI program, and the scores of children in grades four through six represent the follow-up study on children after they had left the IBI program.

From Figure 1, it appears that the IBI program has resulted in children learning English much faster than children in the comparison group. The statistical significance of the superiority in English vocabulary skills for IBI children through fifth grade is such that the probability that this much difference could occur simply by chance is less than 1 in 100.

Comparing the relative scores in English and in Spanish, by first grade the IBI children have a score in their second language, English, that is 70 percent as high as their score in Spanish. In the comparison group at first grade, English vocabulary

Figure 1

MEAN RAW SCORES BY GRADE LEVEL FOR IBI CHILDREN AND A COMPARISON GROUP, IN SPANISH AND ENGLISH VOCABULARY, USING THE **PEABODY PICTURE VOCABULARY TEST**



*The superiority of this score over the comparison group of the same grade is statistically significant at the .01 level, meaning the probability that this much difference would occur by chance alone is less than 1 in 100.

Summary of findings:

1. Children in the IBI program have maintained and improved their Spanish and, at the same time, they have made extremely rapid gains in their second language, English.
2. The superiority of children who received the IBI program is maintained at upper grade levels after they leave the program.
3. The differences in Spanish scores between IBI and comparison group children are not large enough to be statistically significant at any grade level. However, the differences in scores in English vocabulary are highly significant through grade five.
4. Children in the IBI program develop a balanced bilingualism with scores roughly equal in the two languages by grade three; the comparison group children do not develop this until grade six.

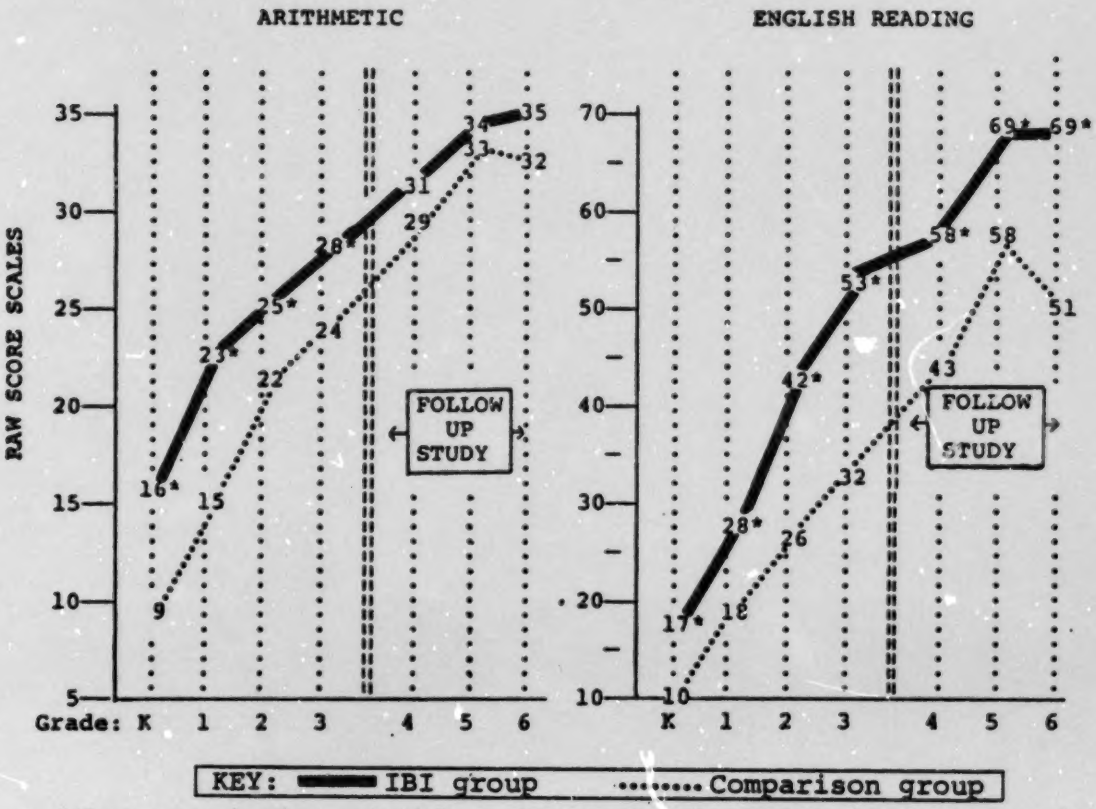
is only 41 percent as high as Spanish. By third grade, children in the IBI program have achieved a balanced bilingualism, with scores in the two languages approximately equal. Children in the comparison group do not achieve this equality between the two languages until sixth grade.

Children in the IBI program who were making very rapid progress in learning English were, at the same time, improving their vocabulary in Spanish. As noted earlier, pretest scores in both Spanish and English of children in the IBI program were, on the average, the same as or lower than the scores of children in the comparison group. As shown in Figure 1, after at least one year's attendance in the program, the IBI children's vocabulary scores in both languages were higher than those of the comparison group. This superiority continued at grades four through six after the children were no longer enrolled in the IBI program. Because both groups of children are nearer the ceiling level of the test in their primary language, there is not enough difference between the scores of the two groups to be statistically significant. A finding of superiority that is consistent over a period of six years, however, is clearly of educational significance.

Test scores from the arithmetic and the reading subtest of the **Wide Range Achievement Test** (Jastak and Jastak, 1965) are shown in Figure 2. The scores in English reading parallel the vocabulary scores in English, which were shown in Figure 1. IBI children have higher scores in English reading at every grade level than the comparison group. The wide margin of difference in scores achieved while children are enrolled in the IBI program up

Figure 2

MEAN RAW SCORES BY GRADE LEVEL FOR IBI CHILDREN AND A COMPARISON GROUP, IN ARITHMETIC AND ENGLISH READING, USING THE **WIDE RANGE ACHIEVEMENT TEST**



*The superiority of this score over the comparison group of the same grade is statistically significant at the .01 level, meaning the probability that this much difference would occur by chance alone is less than 1 in 100.

Summary of findings:

1. Children enrolled in the IBI program achieved much higher scores in basic academic subjects, arithmetic and reading, than children in the comparison group. They maintained this superiority through sixth grade after they had left the IBI program.

2. The differences between IBI children and the comparison group in arithmetic were large enough to be statistically significant while IBI children were attending the program. Although they maintained a superiority in upper grades after leaving the IBI program, the differences were no longer enough to be statistically significant.

3. The superiority of IBI children over the comparison group in English reading is large enough to be statistically significant both during their period of program attendance and for three years at upper grade levels after they left the IBI program.

to grade three is maintained after children are no longer receiving any special program in grades four through six. At every grade level, the difference in scores is large enough to be statistically significant.

The IBI program also teaches children to read in Spanish. But, because of the limited time available for testing of children in the follow-up study, Spanish reading was not included and has therefore not been reported in this paper. However, the children enrolled in the IBI program also had significantly higher scores than the comparison group in Spanish reading (McConnell, 1981).

Arithmetic is less affected by children's language skills and the differences between the groups shown in Figure 2 are not as large as in reading. Nonetheless, the IBI curriculum to teach children arithmetic skills is powerful enough to produce a significant superiority for children while they are participating in the program. This superiority is maintained after they have left the program but not at a statistically significant level. Again, the consistency with which IBI children show a superiority at every grade level would be considered an educationally significant outcome.

DISCUSSION

The purpose of this discussion is to place the findings of the study reported here into a broader context of how they relate to educational follow-up studies over the last two decades. Widespread pessimism prevails over how well various kinds of special early childhood programs produce long-term benefits to children.

Central to this attitude was the widely publicized failure of Head Start programs to maintain the initial increase in IQ and achievement test scores after children entered the public schools. There were a number of other investigations of long-term effects. The more sweeping the study, the less the effect, leading to epitaphs such as Cronbach's (1969): "Programs of compensatory education seem to have had no reliable and lasting effect" (p. 340).

More recently, there has been a re-examination of the long-term effects of some early childhood educational programs that is leading, once again, to some optimism that they may have important lasting benefits (Schweinhart and Weikart, 1980). A consortium was formed among researchers with experimental preschool programs to follow up the participants years later. They attempted to judge the benefits of the programs by achievement test gains as well as by such indicators of school or life success as percentage assigned to special education or retained at grade level, satisfaction of the parents with the child's academic performance, and children's aspirations for higher education, etc. On many of these dimensions, there were found to be lasting effects.

There are two different types of lasting effects, referring in the narrow sense to specific achievement or content tests. Most of the follow-up studies reported in the literature concerning individualized instruction programs refer to the first type, retention of a definite content area. Typically, this type of study involves a test at the conclusion of a course of study and another at some later date to see how much can be remembered after the passage of time. On this type of follow-up study, programs of

individualized instruction have been found to be superior to conventional classroom methods both in level of mastery at the conclusion of study and the degree of retention after the passage of time (see Kulik et al., 1979).

The other type of follow-up study is one that examines a substantially different content than was taught at the time of the educational intervention. Studies that examine later school achievement are of this type. This is a much more difficult test of long-term effect because it depends on the application of previously acquired knowledge or learning skills to a new content area or to a more advanced level of subject matter. Very few studies of this type have examined the consequences of early bilingual instruction. The author found two, both from outside the United States. One was a massive study undertaken by Malherbe (1978) in South Africa involving over 18,000 students. His findings on later school achievement were as follows:

> As regards attainment in "content" subjects, it has often been maintained that, while the partial use of the second language as a medium may help the second language, the child loses in "content." This contention has been definitely disproved in the case of the bilingual school where the results in the ordinary subjects are consistently better than those attained by pupils in unilingual schools--intelligence and home language being kept constant in the two types compared. (Malherbe, 1978, p. 117)

The other follow-up study was done by Revil in the Philippines in 1968 (referred to in Tucker, 1977). This study looked at high school students' performance on a series of tests to assess proficiency in English and Tagalog (official native language in

the Philippines) and in content-subject mastery. This was also a large study, as he examined 64 percent of the 1,500 children originally involved in a large research project in which children were enrolled in different forms of bilingual and unilingual education offered in grades one through six. His findings were the opposite of Malherbe's (1978), namely that children instructed only in English showed significantly higher achievement in both English and Tagalog as well as in content areas.

There are so many confounding factors involving status of the two languages in the political, social, and economic context in other countries that neither of these studies is very instructive for predicting the results of bilingual instruction in the United States.

The follow-up study of the IBI program is certainly a modest one. Its findings, however, are impressive. Later school achievement was found to be related to early bilingual instruction at a level statistically significant for as much as three years after the last year in which children were participating in the bilingual program. Very few other types of early childhood programs have been able to produce consistent academic superiority in later years, let alone at a level that would be statistically significant. Since the areas in which later achievement was the highest all relate to children's acquisition of English, it appears that the increase of ability to communicate in English constitutes a basic skill that has immediate consequences on academic performance. The IBI model of bilingual program produced this

skill more quickly than the traditional educational approach children received in their other schooling.

The cost of curriculum, training, and support staff necessary to implement the total IBI program adds about $600 per year to the cost of a basic day-care program for preschool children, and the one hour of supplemental instruction a day for school-age children costs about $700 per school year. The preschool children receive an educational program lasting about two hours a day, short periods of structured lessons followed by periods of informal child-choice activities appropriate for this age group.

In many school districts, Spanish-speaking children were routinely required to repeat the first grade: the first time to learn English and the second to learn academic subjects. The cost of repeating a year of school in most states was approximately $2000 per child. The children's discouragement at failing a grade in school and the dropout rates that are always higher for "over-age" children are other costs that must be considered in the old system of grade repetition used to integrate Spanish-speaking children into an English-speaking educational program. Compare this to the documented effectiveness of the IBI program. Through bilingual education, the sons and daughters of Spanish-speaking migrant farmworkers can become bilingual and biliterate and bring their academic test scores up to or above the national average of native English-speaking children from the majority culture.

Since the ability to communicate with the teacher in whatever language is used as the medium of instruction is basic to acquiring an education, the investment in educational programs such as

IBI that increase this skill at any early age may be among the most cost-effective investments we could make in education. The findings reported in this paper indicate that the initial expenditure produces continued benefits long after financial supports are withdrawn. It seems important to add that this has been done with a readily available teaching resource: bilingual adults from the same families as the children in need of bilingual services.

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